WELD 0002C - GAS METAL ARC WELDING CERTIFICATIONS ON SHEET AND PLATE

Catalog Description

Prerequisite: Completion of WELD 2B with grade of "C" or better
Hours: 72 (18 lecture, 54 laboratory)
Description: Practice and completion of Gas Metal Arc Welding Certifications on sheet and plate. Upon successful completion of the course, students will hold multiple industry-recognized welding certifications in Gas Metal Arc Welding on sheet and plate in 3G and 4G welding positions. Students may choose to seek employment after successful completion of this course. (not transferable)

Course Student Learning Outcomes

- CSLO #1: Assess respiratory safety and industrial hygiene in the work environment.
- CSLO #2: Evaluate, interpret, and write welding-related documents using specified welding code standards for GMAW.
- CSLO #3: Prepare for and perform a mock interview for a welding job; explain all GMAW certifications the student holds.
- CSLO #4: Pass 70% or more of the GMAW Welder Qualification Weld Tests provided.

Effective Term

Fall 2025

Course Type

Credit - Degree-applicable

Contact Hours

72

Outside of Class Hours

36

Total Student Learning Hours

108

Course Objectives

Lecture Objectives

1. Compare and contrast the welding essential variables and material specifications by code and utilize them to write a GMAW Welding Procedure Specification.
2. Prepare a supplemental heating procedure for the GMAW Welding Procedure Specification.
3. Verbally delivers a 2-minute elevator speech explaining why the student should be hired for a welding job.
4. Explain what welding tasks the student is certified to perform based on a Welder Qualification Text Record for GMAW.

Lab Objectives

1. Practice workplace safety and industrial hygiene principles in the welding lab, especially as they apply to the GMAW process.
2. Demonstrate mastery of GMAW process techniques to control the weld puddle in all positions across various material thicknesses on mild steel and stainless steel.
3. Use basic welding inspection hand tools to visually inspect weldments to a specified welding code standard for GMAW.
4. Perform and pass 70% of the Welder Qualification Weld Tests provided to the specified welding code standards for GMAW.

General Education Information

- Approved College Associate Degree GE Applicability
- CSU GE Applicability (Recommended-requires CSU approval)
- Cal-GETC Applicability (Recommended - Requires External Approval)
- IGETC Applicability (Recommended-requires CSU/UC approval)

Articulation Information

- Not Transferable

Methods of Evaluation

- Classroom Discussions
  - Example: Students will be asked to prepare a resume and cover letter focusing on welding skills obtained through instruction and experience. They will also perform mock interviews with each other. Each student will give a 2-minute speech detailing their knowledge and skills, including explaining their GMAW welder qualification test records. Each student will take turns being the "applicant" and "hiring manager." After the "applicant" student interviews, the "hiring manager" student will provide feedback to the "applicant" student. Students will participate in this activity with multiple other students in a rotation.
- Objective Examinations
  - Example: The student will be given a written exam on various topics. Testing methods include True / False, multiple choice, matching, fill-in-the-blank, and short answer questions. Example: While material thickness ranges differ between codes, 1/8" thick mild steel is governed by both AWS D1.1 and AWS D9.1 code standards, what else differentiates the 2 code standards?
- Problem Solving Examinations
  - Example: The student will be given a complex hypothetical safety violation issue. The student will identify applicable safety violations, prioritize the severity of each violation, and then prescribe corrective actions to mitigate the safety issues. The student must consider the appropriate response times needed when prioritizing corrective actions.
- Reports
  - Example: Students will evaluate a sample GMAW weldment, research the appropriate welding code to apply, and research the essential welding variables to write a Welding Procedure Specification with a supplemental heat treatment procedure.
- Skill Demonstrations
  - Example: The student's GMAW welding skills will be assessed by testing them on various material types, thicknesses, and

positions to applicable welding code standards. Each weldment will be destructively or non-destructively tested as applicable.

Repeatable

No

Methods of Instruction

- Laboratory
- Lecture/Discussion

Lab:

1. Students tour the welding lab to identify potential safety issues. The instructor provides clarifying questions for students to consider. Students collaborate to create an action plan of possible remediation methods. Special focus is placed on GMAW applications. LAB OBJ
2. The instructor demonstrates step-by-step instructions on how to complete each GMAW welder qualification test to industry standards. Students replicate skills taught by also completing each GMAW welder qualification test to the same industry standards. LAB OBJ
3. The instructor provides students with welding samples, visual inspection hand tools, and small sections of welding code standards. The instructor teaches students how to apply the welding code standards to the weld samples using the inspection hand tools to determine acceptable and rejectable discontinuities in the weldments. Then students practice reading, interpreting, and applying the code to new weld samples in groups. Students gain the ability to inspect their weldments and make assessments of the weld quality. Students will make prescriptive corrections for any weldments deemed defective. The instructor will provide input on the students' assessments. Special consideration should be given to GMAW and the potential lack of fusion in weldments. LAB OBJ

Lecture:

1. The instructor will teach students how to navigate welding code books to locate the information they need to create various industry-related documents. The instructor will explain basic terminology important to code reading and comprehension like "should" vs "must." The instructor will explain clauses, code numerals, the index, annexes, addendums, tables, figures, etc. The instructor will help students learn to prioritize seemingly conflicting code directives. Students will be expected to take notes and apply the information taught to complete the assigned homework. LEC OBJ 1, 2, 4

Typical Out of Class Assignments

Reading Assignments

Read AWS D1.1 Clause 5 Prequalification Table 5.4 PWPS Requirements and be prepared to discuss in class.

Writing, Problem Solving or Performance

Read AWS D1.6 Clause 6 Qualification Table 6.1 Essential Variables for Procedure Qualifications. Then read the sample Procedure Qualification Report. Based on these 2 artifacts write a functional Welding Procedure Specification for GMAW short-circuit transfer mode.

Other (Term projects, research papers, portfolios, etc.)

Required Materials

- GMAW / FCAW Handbook
  - Author: Minnick, Mosman
  - Publisher: Goodheart-Willcox Company, Inc.
  - Publication Date: 2023
  - Text Edition: 2nd
  - Classic Textbook?: No
  - OER Link:
  - OER:

Other materials and-or supplies required of students that contribute to the cost of the course.

Optional half-mask sealed respirator with N95 cartridges